

5 WHAT IS CLAIMED IS:

1. A fluid delivery system for delivering at least two different fluids into separate lumens of a multi-lumen catheter, said system comprising:  
a first fluid reservoir comprising a dissolution fluid; and  
10 a second fluid reservoir comprising a dissolution fluid attenuating fluid.
2. The system according to Claim 1, wherein said system comprises a separate fluid dispensing means for each of said dissolution fluid and dissolution fluid attenuating fluid.
- 15 3. The system according to Claim 2, wherein each of said fluid dispensing means is a metered fluid dispensing means.
4. The system according to Claim 1, wherein said system comprises a single fluid dispensing means for each of said at least two different fluids.
- 20 5. The system according to Claim 4, wherein said single fluid dispensing means is a metered fluid dispensing means.
6. A system for flushing an internal site with two different fluids, said system  
25 comprising:  
(a) a multi-lumen catheter;  
(b) a fluid delivery system according to Claim 1; and  
(c) a negative pressure means sufficient to aspirate fluid from a lumen of said  
multi-lumen catheter.
- 30 7. The system according to Claim 6, wherein said fluid delivery system comprises a separate first and second fluid dispensing means.
8. The system according to Claim 7, wherein said first and second fluid dispensing  
35 means are metered fluid dispensing means.

9. The system according to Claim 6, wherein said fluid delivery system comprises a single fluid dispensing means comprising first and second fluid reservoirs.

10. The system according to Claim 9, wherein said single fluid dispensing means is a metered fluid dispensing means.

11. The system according to Claim 10, wherein said metered dispensing means comprises a cartridge that includes first and second fluid reservoirs.

12. The system according to Claim 11, wherein said metered dispensing means comprises a means for increasing the internal pressure of each of said first and second fluid reservoirs.

13. The system according to Claim 12, wherein said means for increasing the internal pressure of each of said first and second fluid reservoirs comprises a separate compression means for each of said first and second fluid reservoirs.

14. The system according to Claim 12, wherein said means for increasing the internal pressure of each of said first and second fluid reservoirs comprises a single compression means for each of said first and second fluid reservoirs.

15. The system according to Claim 6, wherein said system further comprises a balloon inflation means.

16. A system for simultaneously flushing an internal site with two different fluids, said system comprising:

(a) a multi-lumen catheter comprising first, second and third lumens;

(b) a metered fluid delivery system comprising a first reservoir containing a dissolution fluid and a second reservoir containing a dissolution fluid attenuating fluid, wherein said metered fluid delivery means is capable of delivering said first and second

- 5 23. The fluid storage means according to Claim 21, wherein said dissolution fluid is selected from the group consisting of: an organic matter dissolution fluid and an inorganic matter dissolution fluid.
- 10 24. The fluid storage means according to Claim 23, wherein said inorganic matter dissolution fluid is an acidic dissolution fluid.
25. The fluid storage means according to Claim 23, wherein said organic matter dissolution fluid comprises a detergent.
- 15 26. The fluid storage means according to Claim 24, wherein said dissolution fluid attenuating fluid is a pH elevating solution.
27. The fluid storage means according to Claim 26, wherein said pH elevating solution is a buffer solution.
- 20 28. The fluid storage means according to Claim 21, wherein each of said two fluid reservoirs comprises an outlet port.
29. The fluid storage means according to Claim 21, wherein each of said two fluid reservoirs is compressible.
- 25 30. The fluid storage means according to Claim 21, wherein said fluid storage means is a cartridge.
- 30 31. A cartridge containing:  
a first compressible fluid reservoir having an outlet port and comprising a dissolution fluid; and  
a second compressible fluid reservoir having an outlet port and comprising a dissolution fluid attenuating fluid.
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5 fluids into said first and second lumens of said multi-lumen catheter at substantially the same flow rate;

(c) a negative pressure means sufficient to aspirate fluid from said third lumen of said multi-lumen catheter;

(d) a balloon inflation means.

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17. The system according to Claim 16, wherein said metered fluid delivery system comprises a means for increasing the internal pressure of each of said first and second fluid reservoirs.

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18. The system according to Claim 17, wherein said means for increasing the internal pressure of each of said first and second fluid reservoirs comprises a separate compression means for each of said first and second fluid reservoirs.

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19. The system according to Claim 17, wherein said means for increasing the internal pressure of each of said first and second fluid reservoirs comprises a single compression means for each of said first and second fluid reservoirs.

20. The system according to Claim 17, wherein said first and second fluid reservoirs are present in a cartridge.

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21. A fluid storage means, wherein said fluid storage means comprises:  
at least two fluid reservoirs, wherein a first of said at least two fluid reservoirs contains a dissolution fluid and a second of said at least two fluid reservoirs contains a dissolution fluid attenuating fluid.

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22. The fluid storage means according to Claim 21, wherein said fluid storage means has only a first and second fluid reservoir.

- 5 32. The cartridge according to Claim 31, wherein said dissolution fluid is selected from the group consisting of an inorganic matter dissolution fluid and an organic matter dissolution fluid.
- 10 33. The cartridge according to Claim 32, wherein said inorganic matter dissolution fluid is an acidic solution.
34. The cartridge according to Claim 32, wherein said organic matter dissolution fluid comprises a detergent.
- 15 35. The cartridge according to Claim 31, wherein said dissolution fluid attenuating fluid is a pH elevating fluid.
- 20 36. The cartridge according to claim 35, wherein said pH elevating fluid is a buffer solution.
- 25 37. A fluid delivery system comprising:
- (a) a cartridge containing:
    - (i) a first compressible fluid reservoir having an outlet port and comprising a dissolution fluid; and
    - (ii) a second compressible fluid reservoir having an outlet port and comprising a dissolution fluid attenuating fluid;
  - (b) a housing comprising a holder for said cartridge.
- 30 38. The fluid delivery device according to Claim 37, wherein said device further comprises a means for compressing said compressible fluid reservoirs.
39. The fluid delivery device according to Claim 37, wherein said means for compressing said compressible fluid reservoirs comprises a pressurized gas source.

5 40. The fluid delivery device according to Claim 39, wherein said pressurized gas source is present in a pressurized gas source holder in said housing.

41. The fluid delivery device according to Claim 37, wherein said device comprises a vacuum bottle holder.

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42. A method for delivering at least two fluids into two separate lumens of a multi-lumen catheter, said method comprising:

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- (a) establishing fluid communication between said two separate lumens and a fluid delivery system according to Claim 1; and
  - (b) actuating said fluid delivery system in a manner sufficient to deliver said at least two different fluids into different lumens of said multi-lumen catheter;

whereby said at least two fluids are delivered into different lumens at substantially the same rate.

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43. The method according to Claim 42, wherein said fluid delivery means comprises at least two separate fluid reservoirs and said actuating comprises increasing the pressure inside said at least two separate fluid reservoirs.

25 44. The method according to Claim 43, wherein said pressure inside said at least two separate fluid reservoirs is increased by compressing said at least two separate fluid reservoirs.

30 45. A method for simultaneously flushing an internal vascular site of a host with two different fluids, said method comprising:

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- (a) providing a system comprising:
    - (i) a multi-lumen catheter comprising first, second and third lumens;
    - (ii) a metered fluid delivery system comprising a first reservoir containing a dissolution fluid and a second reservoir containing a dissolution fluid attenuating fluid, wherein said metered fluid

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delivery means is capable of delivering said fluids into said first and second lumens of said multi-lumen catheter at substantially the same flow rate; and

(iii) a negative pressure means sufficient to aspirate fluid from said third lumen of said multi-lumen catheter;

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(b) positioning a distal end of said multi-lumen catheter at said internal vascular site;

(c) actuating said metered fluid delivery means and said negative pressure means in a manner sufficient to introduce and remove fluid from said vascular site and maintain substantially isobaric conditions at said vascular site;

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whereby said internal vascular site is simultaneously flushed with said fluids.

46. A kit for use in flushing an internal vascular site with two different fluids, said kit comprising:

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(a) a fluid storage means comprising first and second fluid reservoirs, wherein a first fluid reservoir contains a dissolution fluid and said second fluid reservoir contains a dissolution fluid attenuating fluid; and

(b) instructions for using said fluid storage means in a system according to Claim 1.

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47. The kit according to Claim 46, wherein said kit further comprises a means for moving said dissolution fluid and said dissolution attenuating fluid from said first and second fluids reservoirs into first and second lumens of a multi-lumen catheter at substantially the same rate.

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48. The kit according to Claim 46, wherein said fluid storage means is in the form a cartridge.

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49. The kit according to Claim 48, wherein said kit comprises a fluid delivery device according to Claim 37.

50. The kit according to Claim 46, wherein said kit further comprises at least one additional component selected from the group consisting of: a multi-lumen catheter; a guidewire; plastic tubing; vacuum bottle; and balloon inflation syringe.

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